Abstract

Five years after its introduction at a state mental hospital, an automated drug exception review system continues to show a long-term impact on the prescribing practices of hospital physicians. While the overall rate of exceptions has remained low, approximately one quarter of all new exceptions pointed out by the computer result in a change in the order by the physician. The fact that 60% of new exceptions are justified suggests that some forms of polypharmacy may be appropriate. The integration of the exception reporting system into the clinical review process has avoided the danger of the computer being seen as an adversary to the clinician or as exerting a "big-brother"-like control over psychopharmacologic prescription practices.

An automated drug exception system which provides a quality assurance review for psychotropic drug orders in exception to predetermined prescribing guidelines has been in place at Rockland Psychiatric Center (RPC) under the auspices of the Multi-State Information System (MSIS) since 1975. The present study was an attempt to examine the long-term impact of this system as regards: (1) the appropriateness of the guidelines; (2) the nature of the clinician-computer interaction and (3) the long-term impact on prescribing practices.

Method

The automated drug review system consists of a drug ordering segment which captures all psychotropic drug prescriptions ordered for RPC inpatients and an exception review module which automatically reviews all new drug prescriptions against a predetermined set of guidelines falling into two broad categories: dosage and polypharmacy. In addition, polypharmacy guidelines include both prescription of more than one drug within the same drug class (e.g., neuroleptics (NL), tricyclic antidepressants (TCA), antiparkinson drugs (AP), antianxiety agents (AA) and hypnotics (HY)), and prescription of potentially hazardous combinations of differing drug classes.

When an exception is identified, the computer produces a letter to the prescribing physician with a copy forwarded to the physician's immediate physician supervisor. In consultation, these physicians decide whether the exception is acceptable, based on the patient's clinical needs, or whether a change in medication orders is indicated. When agreement is reached, the decision is referred to a Drug Monitoring Committee (DMC) of physicians for review which also arbitrates in the event a consensus cannot be reached by the prescribing physician and supervisor. Thus, the computer triggers a physician clinical review process.

The present study focused on the computer exception reports generated during the period January, 1981 through January, 1982. The authors retrieved three broad categories of consultation outcome from these reports: (1) justification; (2) medication change; (3) other.

Results

During an average month, approximately 7% of the total patient population receiving psychotropic drugs had exceptions reported by the automated system. During the study period, there was a total of 263 exceptions. The most common categories of exception were (in order of frequency): high dosage (30.4%), NL plus TCA (25.5%), more than one NL (19.8%) and NL plus AA (10.3%), with the combination of NL plus HY and NL plus AP plus TCA averaging about 6% of all exceptions. Overall, 60% of all exceptions were considered justified while about one-quarter resulted in a drug change. However, there were substantial differences in exception outcome by exception type. Thus, for example, only one quarter on the more than one NL exception and only about 50% of the NL plus HY and high dosage exceptions were justified as compared to over 75% of the NL plus TCA, NL plus AA and NL plus AP plus TCA exceptions.

Discussion

With respect to the original study questions, the following findings were observed:

Appropriateness of Guidelines: The responses of the clinician-supervisor consultation to the exception reports suggests that certain exceptions are clearly justified in most cases while others result in a drug change in a substantial proportion of cases. For example, the exception of NL plus TCA
and NL plus AP plus TCA resulted in a drug change in less than 10% of the cases whereas the exceptions of more than one NL resulted in a drug change in almost half the cases and those of NL plus HY and of high dosage led to a drug change a third of the time. Using the relative frequency of justification (or drug change) as a rough index of appropriateness, it would seem that the former two guidelines (NL plus TCA and NL plus AP plus TCA) are of limited value and might be considered for discontinuation. These findings support Holister's contention that some polypharmacy combinations may make sense. In our experience with the drug system, the elimination of exception guidelines which are not clinically meaningful appears to be important in maintaining the credibility of the overall system as regards clinicians. Along these lines, one exception (the use of lithium and haloperidol in combination), which had been part of the original set of guidelines, had been eliminated prior to the study period when the weight of evidence failed to support the original report which suggested its potential for inducing organic brain toxicity. In addition, the fact that certain polypharmacy combinations are justified in the overwhelming majority of cases supports the suggestion that more research is needed to determine the appropriate place of polypharmacy in the use of psychotropic drugs.

In contrast, those guidelines which resulted in a substantial amount of drug change appear to be clearly appropriate as validated by clinician-supervisor response.

Nature of the Clinician-Computer Interaction: The integration of the drug exception system into a physician controlled clinical review process appears to have minimized the potential problems of the implementation of such systems predicted elsewhere. The fact that the majority of exceptions were justified is inconsistent with the concerns about computer control of pharmacologic prescribing practices. The clinicians were clearly not merely obeying the computer. These findings must, however, be considered in view of the fact that the drug exception system had been in place at RPC for more than five years prior to the study period. Thus, the RPC physicians had ample time to become accustomed to receiving and responding to exception reports. Also, clinicians and supervisors responded adequately to over 95% of the exceptions, indicating a high degree of cooperation with the collegial review system. Of course, implementation of such a system with a more authoritarian or perhaps even non-clinical review process might result in a very different clinician response. However, our experience suggests that using the computer as a trigger for clinical review within a collegial peer review process can be accomplished with a high degree of cooperation and minimal resistance. An important question remaining, which could not be addressed in the context of this study was whether the presence of automated review might have inhibited physicians from using polypharmacy where appropriate.

Long-Term Impact on Prescribing Practices: The overall exception rate of 74% in this study is markedly lower than those reported in earlier studies of psychotropic prescribing practices in similar settings. The initial two years of the use of this system, in conjunction with ongoing educational programs, were accompanied by a precipitous drop in exception rates from a previous level of 30-40% of all patients receiving psychotropic drugs experiencing an exception. It would appear that the ongoing system has been maintaining an "irreducible minimum" of exceptions within the facility. However, to prove the continued effectiveness of the system would, of course, require the removal of the reporting system to see if there is an increase in the exception rate in the absence of the current review. While the present study did not address this issue directly, the fact that the exception reports resulted in a drug change in a quarter of the cases suggests that the system continues to have an effect even after five years of exposure. However, perhaps a more important value of the system at this point is its functioning as a catalyst for structured clinical review of potentially hazardous prescriptions even though the exception might be justified, which seems unlikely to occur in the absence of an automated system capable of quickly sifting through thousands of orders to identify those few that are exceptions.

References